

## **SECTION 207 CULVERT EXCAVATION AND TRENCH EXCAVATION**

**207.01 DESCRIPTION.** This work is the excavation for placing or removing drainage and other appurtenant structures. It includes foundation preparation, backfilling, disposal of excavation material, bailing, drainage, sheeting, shoring and cribbing. Excavation classes are described below:

**207.01.1. Culvert Excavation.** Culvert excavation is all work under Subsection 207.01, where vertical walls are not required and the excavation width is not specified.

**207.01.2. Trench Excavation.** Trench excavation is the excavation for placing or removing storm drains, sanitary sewers, water lines, and other installations in the Contract. Vertical trench walls, when required, must be shored or supported to meet the U.S. Department of Labor, Occupational Safety and Health Administration, Safety and Health Regulations for Construction ( O.S.H.A.). Trench widths are specified in Subsection 207.03.3

**207.02 RESERVED.**

### **207.03 CONSTRUCTION REQUIREMENTS.**

**207.03.1 General.** Excavate to permit removal, jointing and backfilling of pipe.

Construct and maintain the excavations to prevent personal injuries, damage to foundations, structures, pole lines, or other facilities.

Pile and maintain all excavated material to meet O.S.H.A. requirements and with a minimum of inconvenience to the public. Do not obstruct fire hydrants, water valves, meters, and the free flow of storm water in gutters, other conduits, and natural water courses.

Do not excavate below the specified depth, except as permitted in Subsection 207.03.6.

Remove all obstructions in the excavation at Contractor expense.

Backfill excavated areas to meet Subsection 603.03.4. Do not place backfill against newly constructed masonry or concrete structures for at least 14 days. Remove all sheeting and bracing before backfilling.

**207.03.2 Culvert Excavation.** When special foundation stabilization is specified, excavate the bedding trench walls vertically and the trench width to provide room for the bedding material.

**207.03.3 Trench Excavation.** Keep trench lengths to a minimum in paved roadways, sidewalks, or other improved areas, in advance of the pipe laying and not to exceed 200 feet (61 m). Keep trench backfilling and compaction to within 300 feet (91.5 m) of the installed pipe.

Cut the pavement full depth vertically along regular neat lines in paved roadways that require patching. Excavate the minimum trench width possible.

When vertical trench walls are specified, the maximum trench width is the external width of the pipe barrel plus 3 feet (915 mm). When a special foundation is specified, excavate the bedding trench walls vertically and the trench width as specified.

Do not exceed the specified trench width without the Project Manager's approval when vertical trench walls are specified.

Furnish any additional select backfill material and additional surface and subsurface improvements if the maximum trench width is exceeded at Contractor expense.

**207.03.4 Excavation for Appurtenant Structures.** Excavate for riprap, rubble masonry, retaining walls, cutoff walls, headwalls, manholes, drop inlets, catch basins, headgates, division boxes, and other structures appurtenant to culverts, sewers, drains, pipes, or tubing to meet the applicable requirements of Subsection 207.03.1.

**207.03.5 Shoring.** Provide and remove shoring or supports for the excavation walls, that protect the work, existing property, utilities, pavement, and other existing facilities. Provide safe working conditions meeting O.S.H.A., local and state safety codes.

Repair damage caused from excavation support failure or from failure to provide support at Contractor expense.

**207.03.6 Foundation Preparation.** Compact foundations for culverts, sewers, drains, pipes, tubing, and appurtenant structures to the moisture and density requirements of Subsection 203.03.3.

Remove unstable or unsuitable material encountered below the excavation floor elevation and replace with material meeting Subsection 701.04.2. Cover with bedding material meeting Subsection 701.04.1 as directed. The Project Manager will investigate unstable pipe installations requiring 4 feet (1.2 m) or more of foundation material.

Remove unyielding material below the staked elevation to at least 12-inches (305 mm) and replace with bedding material meeting Subsection 701.04.

Bed culverts larger than 12-inches (305 mm) as shown in the Detailed Drawings. Place bedding for 12-inch (305 mm) diameter and smaller culverts to uniformly support the culvert throughout its length. The bedding does not need to conform to the outside of the culvert.

Do not lay pipe until the foundations are approved by the Project Manager. Remove and relay pipe laid on unapproved foundations at Contractor expense.

Use Class C foundation for reinforced concrete pipe.

**207.04 METHOD OF MEASUREMENT.** Culvert and trench excavation is measured in its original position by the cubic yard (cubic meter) as follows:

Culvert excavation measurement is the volume bounded on the bottom by the established elevations for the excavation floor; on the sides by vertical planes 12-inches (305 mm) outside of the inside walls of the pipe or culvert,

**CULVERT EXCAVATION AND  
TRENCH EXCAVATION**

**207.05**

and on the ends by vertical planes 12-inches (305 mm) outside the neat lines of the pipe or culvert.

Trench excavation measurement is the volume bounded on the bottom by the elevations established for the excavation floor, on the sides by vertical planes 18-inches (460 mm) outside of the inside walls of the pipe or culvert, and on the ends by vertical planes 12-inches (305 mm) outside the neat lines of the pipe or culvert.

Culvert or trench excavation within the structure neatlines for culverts, sewers, drains, pipes, tubing, or other installations entering structures is not measured for payment.

When a special foundation is required, measurement is the distance between the vertical planes bounding the sides of the special foundation of the bedding trench.

In cut sections, culvert excavation and trench excavation are not measured for payment above the staked template section. When the Project Manager requires culvert excavation or trench excavation before excavation for the template section, the culvert excavation or trench excavation is measured to the existing ground surface.

In fill sections, culvert excavation and trench excavation is not measured for payment above the natural ground line as cross sectioned.

Shoring for culvert excavation and trench excavation is not measured for payment. Sheeting materials directed to be left in place are paid for under Subsection 207.05.

Measurement of excavation for flared end terminal sections or special end sections is based on regular barrel dimensions extended through these sections.

Excavation and foundation preparation for appurtenant structures is not measured for payment.

Bedding material and foundation material is measured under Subsection 603.04.3.

**207.05 BASIS OF PAYMENT.** Payment for the completed and accepted quantities is made under the following:

<b><u>Pay Item</u></b>	<b><u>Pay Unit</u></b>
Culvert Excavation	Cubic Yard (cubic meter)
Trench Excavation	Cubic Yard (cubic meter)
Bedding and Foundation Material	Cubic Yard (cubic meter)

Payment at the contract unit price is full compensation for all resources necessary to complete the item of work under the Contract.

Sheeting materials directed to be left in place are paid for at invoice cost supported by material and freight bills. No additional allowance is made for installation, handling, overhead, insurance, profit, or any other costs.

Payment for excavation and foundation preparation for appurtenant structures is included in payment for the respective structural items.